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731,861



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Specification : Feb. 12, 1953.  
Application made in Germany on Sept. 8, 1952.  
Complete Specification Published : June 15, 1955.

No. 3961/53.

Index at acceptance:—Class 130, C1A(4:5).

## COMPLETE SPECIFICATION

### Improvements in the Production of Cigarettes with Mouthpieces

#### ERRATA

SPECIFICATION No. 731,861

Page 1, line 1, for "Kurt Korber and Eugen Korber" read "Kurt Körber and Eugen Köper"

Page 1, line 3, for "Kurt Korber & Co. K-G.," read "Kurt Körber & Co. K-G.,"

THE PATENT OFFICE,  
19th December, 1955.

and subject to suction action. Two known folding-down methods may be distinguished 20 for folding down the connecting strips about the abutting points between the cigarette and the mouthpiece, namely: firstly, folding down during the movement of the cigarette and mouthpiece in the direction of the longitudinal axis of the cigarette (string processes) or, secondly, folding down during movement transversely thereto, in which groups of cigarettes and mouthpieces are moved on a conveyor device perpendicular to the longitudinal axis of the cigarettes. The following 30 features are concerned with the second method.

In this method the cigarettes may be withdrawn in known manner firstly in pairs, 35 for example, from a storage device, and fed to a drum in mutually spaced condition and a mouthpiece of double length introduced between both cigarettes, the mouthpiece being normally withdrawn from a storage 40 device as a continuous piece of six-fold length and divided twice before it is transferred. The groups of cigarettes and mouthpieces are then moved to a feed device together with a connecting strip coated with 45 adhesive, at a station provided for this purpose.  
[Price 3/-]

movement perpendicular to the previous movement path, which is moreover effected very rapidly, tobacco often falls out at the 65 ends so that on the one hand the machine is very quickly soiled and on the other hand the smoker has many tobacco particles in the mouth.

In another known construction of the 70 second method the device is so constructed that the cigarette and the mouthpiece remain in the pitch circle but a special striker device is moved over the assembly in the longitudinal direction of the cigarette so that with this 75 device difficulties are encountered in laying the connecting strip evenly and flatly about the abutting points, which has for its result that firstly the connection between the cigarette and the mouthpiece is not satisfactorily 80 effected and secondly that also the appearance of the cigarette is adversely affected.

In this connection it should also be stated that a further possibility, namely of passing 85 down the two end flaps of the connecting strip by rolling the cigarette-mouthpiece assembly, for example on a conveyor at the abutting points, cannot be considered for the above mentioned grounds.

In one of the known devices already men- 90

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## COMPLETE SPECIFICATION

### Improvements in the Production of Cigarettes with Mouthpieces

We, KURT KORBER and EUGEN KOBER, both German Citizens, trading as KURT KORBER & Co. K-G., of 139, Weidenbaumschw., Hamburg-Bergedorf, Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The invention relates to a device applicable when uniting cigarettes with mouthpieces, for folding down the flaps of a connecting strip of desired material around the abutting points of cigarette-mouthpiece  
15 assemblies lying on a rotary conveyor device moved perpendicularly to the longitudinal axis of the cigarettes for example on a drum, and subject to suction action. Two known folding-down methods may be distinguished  
20 for folding down the connecting strips about the abutting points between the cigarette and the mouthpiece, namely: firstly, folding down during the movement of the cigarette and mouthpiece in the direction of the longitudinal axis of the cigarette (string processes)  
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pose. This connecting strip is folded around the abutting points conveniently on a further feed device, for example a drum; the holding of the individual parts is generally effected by air (vacuum). 50

In the second method mentioned it is also known for the cigarette-mouthpiece assemblies to be disposed together with the connecting strips in grooved recesses on the periphery of a rotary drum, in such a way 55 that the longitudinal axis of each assembly is located on the level of the pitch circle of the drum driving wheel disposed coaxially thereto (for example a spur wheel). For the purpose of folding down the connecting 60 strip the assembly is moved out of the pitch circle. By this change in the direction of the movement perpendicular to the previous movement path, which is moreover effected very rapidly, tobacco often falls out at the 65 ends so that on the one hand the machine is very quickly soiled and on the other hand the smoker has many tobacco particles in the mouth.

In another known construction of the 70 second method the device is so constructed that the cigarette and the mouthpiece remain in the pitch circle but a special striker device is moved over the assembly in the longitudinal direction of the cigarette so that with this 75 device difficulties are encountered in laying the connecting strip evenly and flatly about the abutting points, which has for its result that firstly the connection between the cigarette and the mouthpiece is not satisfactorily 80 effected and secondly that also the appearance of the cigarette is adversely affected.

In this connection it should also be stated that a further possibility, namely of passing 85 down the two end flaps of the connecting strip by rolling the cigarette-mouthpiece assembly, for example on a conveyor at the abutting points, cannot be considered for the above mentioned grounds.

In one of the known devices already men-

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Pages 75p

tioned one flap is laid flat about the abutting points to enclose the connecting strip transversely to the longitudinal axis of the cigarette and to shift the assembly out of the pitch circle, while for the second flap the folding element provided for this purpose does not engage and press down the flaps according to the curvature of the diameter of the cigarette and in consequence around the cigarette, but only engages the flaps at its outer part. By these means it may occur that the end part only of the second flap is firmly pressed into engagement, in this case also a rigid connection between the mouthpiece and the cigarette is not positively obtained.

The use of brushes cannot be considered for laying down the flaps since some brush hairs may easily fall out or may be withdrawn by the adhesive and can be stuck down.

The object of the invention is in the first place to reduce as much as possible the loss of tobacco from the ends of the cigarette and secondly to fold down the connecting strip completely and firmly at the abutting points. This is obtained according to the invention by a construction comprising a continuously rotating member to support cigarettes and mouthpieces in abutting relation, means to feed cigarettes and mouthpieces thereto, with an adhesive coated strip attached to the zone of contact between each cigarette and mouthpiece, radially movable elements on said rotating member adapted to fold down two projecting flaps of said strip while the corresponding cigarette-mouthpiece assembly is in movement in a continuous path without rotation or radial displacement relative to the rotating member and means to actuate said elements to fold down first one flap and then the other flap of said strip around said zone of contact. Preferably the axis of the cigarette-mouthpiece assembly, from the receiving point thereof on the rotating member to a delivery point thereof from the rotating member lies on the rotary member at the level of the pitch circle of a driving gear wheel lying coaxially thereto, said gear wheel being for example a spur gear wheel.

During the continuous movement of the rotating member, which may be a rotary drum, the folding elements of the folding device move against the periphery of the cigarette or against the connecting strips which are applied at a preceding position already on the cigarette-mouthpiece assembly; at the same time retaining or holding pins or the like press on the cigarette from the opposite side. The folding elements follow the curvature of the cigarette and apply first one flap and then the second flap around the abutting points. The retaining pins are already separated from the cigarette-mouthpiece assembly when the folding ele-

ments approach one another.

After the folding down of the connecting strip is terminated the cigarette-mouthpiece assembly is divided in known manner into two mouthpiece cigarettes and both cigarettes are moved apart in suitable manner. This latter construction does not, however, fall within the scope of protection of the invention.

One constructional embodiment of the invention is shown and described in the following description with reference to the accompanying drawings wherein:—

Fig. 1 shows a folding-down drum with a feeder drum, counter drum, cutting device and take-off belt, but without the folding down device, in diagrammatic side view;

Fig. 2 is a partial section of the folding-down drum according to Fig. 1 but with the folding-down device and the counter drum in side view and on an enlarged scale;

Fig. 3 is a diagrammatic view showing one groove of the supporting drum with two cigarettes and the mouthpiece unit located between them and one-part folding elements, seen in the direction of the arrow III in Fig. 2;

Figs. 4 and 5 show other embodiments of the folding elements;

Fig. 6 is a diagrammatic view of another folding device; and

Fig. 7 is an enlarged detail view showing the mounting of the folding elements of Fig. 2.

A rotary drum 2 (folding-down drum) is mounted on a shaft 1 and driven so as to rotate continuously during operation and on its periphery there are grooved recesses 3 running parallel to the shaft 1, into which passages 4 open. The passages 4 are in communication with a segmental hollow space 5 (suction chamber) within the drum 2 through lateral bores 4' and radial bores 4". The suction chamber 5 is in turn connected, for example by a suction pipe 6 and a bore 7 through the shaft 1 with a suction device of known type.

Two cigarettes 8 are disposed for example, in a recess 3 (see Fig. 3) and in abutting relation between them is a mouthpiece 8a for each two cigarettes together with an adhesive-coated strip 9 (see Figs. 1 and 2) which projects in V-shape manner from the recess 3. The cigarette-mouthpiece assembly 8, 8a is fed to the folding-down drum 2 together with the connecting strip 9 attached to the cigarette-mouthpiece zones of contact, in the present embodiment (Fig. 1) from a drum 10 (feeder drum) on a shaft 11. A further drum 13 is mounted on a shaft 12 parallel to the shaft 1, which drum embodies two end walls the spacing of which is greater than the length of the radially movable folding elements 20 and 36 and which are connected one with the other by means 130

of spacer rods 14. These spacer rods 14 (holding pins) run parallel to the shaft 12 and, during initial operation of the folding elements, press against the cigarette-mouthpiece assembly 8, 8a disposed in the grooves 3. Moreover gear wheels 15, 16, 17 are fixed to the shafts 1, 11 and 12, which gear wheels engage one with the other and contact one another at their pitch circles at the level of the longitudinal axis of the assembly 8, 8a. While the assembly 8, 8a is connected with the suction chamber 5 the connecting strip 9 on the folding-down drum 2 is laid around the assembly by means of a folding-down device which will be described further below. At the points within the drum where suction is not to be exerted there is located a stationary solid segment 5' which stops the flow of air.

The folding-down device is constructed as follows: for each groove 3 of the drum 2 there is provided a folding device consisting of two folding elements and two folder carriers 18, 34 disposed intermediately of the drum 2 and projecting through gaps in the drum periphery. The carrier 18 has at its outer end a pivot 19 about which a folding element 20 with rounded head 21 can rotate.

There is preferably provided in the pivot 19 a torsion spring which tends to rotate the folding elements 20 continuously towards the assembly 8a. Further a pin 22 is secured to the folder carrier 18 which coacts with a link 23 which is mounted on a shaft 24, for example by means of clamp screws 25. The link 23 has at its forward end a slot 26 which serves for introduction of the pin 22. A second link 27 is mounted on the shaft 24 and carries a roller 28 which rolls on a stationary cam track 29 of a cam disc. Further a tension spring 30 is secured to the folder carrier 18 which tends to draw the latter inwardly along a shaft 31 located adjacent it. The folding element serves to move one flap of the connecting strip 9 over the abutting points 33 of the assembly 8a following the curvature of the assembly (Fig. 3).

Similarly the other folding element and its folder carrier for the other flap of the connection strip 9 is constructed and operates in a similar manner. The folding element 36 is rotatably supported by a pivot 35 on the folder carrier 34. A torsion spring is also located about the pivot 35 which tends to urge the folding element 36 constantly inwardly. A link 38 which is supported on another shaft 31 moves around a pin 37 on the folder carrier 34. The drive is effected from a second stationary cam track 40 through a roller 41 and a link 42 secured on the first shaft 31 and then to the pin 37. A tension spring 43 pulls the folder carrier 34 inwards along the shaft 24. The cam tracks 29 and 40 lie one beyond the other in the example shown, and provide a common drive for the

two groups of folder carriers. All the shafts 24, 31 are journaled in the side walls of the drum and they also serve as bearing members against which the folder carriers are pressed by the springs 30.

The method of operation of the device is shown in Fig. 2 in the successive working phases but it is possible that the sequence of the folding-down may be effected in a different order. In the example shown both folder carriers 18 and 34 are moved upwardly from the position shown on the left-hand side of Fig. 2, and then the carrier 18 is moved up so far on its own until the elements 20 have been brought over the position 20' over the assembly 8, 8a and the one flap has been folded onto the connecting strip 9. Then the return movement of the carrier 18 commences and at the same time the forward movement of the other carrier 34 until this carrier has reached the position 36' whereupon the return movement of this carrier is effected and finally both carriers 34 and 18 move downwardly towards their starting position so far that the mouthpiece 8a can be cut through by the knife 44. Throughout this operation the cigarette-mouthpiece assembly acted on has been in movement in a continuous path without rotation or radial displacement relative to the drum 2.

Instead of the folding-down device described an alternative shown diagrammatically in Fig. 6 may be adopted. The folding element 46 projects forwardly from one member 45 of a folder carrier forming an articulated parallelogram linkage and is rotatably mounted on the pivot 47 in which is also located a torsion spring. An angled lever 49 is connected to the link member 48 and a rocking lever 51 is connected to the link 50. The angled lever 49 rotates about a fulcrum 52 and the rocking lever 51 pivots about a fulcrum 53. A roller 54 is provided at one end of the angled lever 49 which rolls in a cam track 55. A spring 56 may be additionally provided to absorb the play in the linkage in order to ensure smooth operation. The left-hand section of the folding device according to Fig. 6 is of similar construction, but is not shown.

After folding down of the connecting strip 9 the mouthpiece 8a is divided. In the construction shown the division is effected on the folding-down drum. In this case a channel-like recess 32 must be provided around the periphery of the drum for the cutting device 44, shown as a circular knife in Fig. 1. Finally the mouthpiece cigarettes are led away from the folding-down drum.

The mouthpieces above referred to may be mouthpieces of any desired kind such for example as paper mouthpieces with and without filter inserts, filter mouthpiece elements with and without wrappings, filter

mouthpieces with fillings of various kinds and so on.

It should be mentioned that the holding pins 14 can be controlled independently in some cases in known manner.

The folding elements 20 and 36 can instead of being formed in one piece as in Fig. 3, also each be divided into one or more parts, as shown in Figs. 4 and 5, but having common operating means.

What we claim is:—

1. Apparatus for attaching mouthpieces to cigarettes comprising a continuously rotating member to support cigarettes and mouthpieces in abutting relation, means to feed cigarettes and mouthpieces thereto, with an adhesive coated strip attached to the zone of contact between each cigarette and mouthpiece, radially movable elements on said rotating member adapted to fold down two projecting flaps of said strip while the corresponding cigarette-mouthpiece assembly is in movement in a continuous path without rotation or radial displacement relative to the rotating member and means to actuate said elements to fold down first one flap and then the other flap of said strip around said zone of contact.

2. Apparatus for attaching mouthpieces to cigarettes comprising a rotary drum having transverse grooves therein, a driving gear wheel for said drum, means to feed to said drum grooves pairs of cigarettes each with an interposed double-length mouthpiece and with an adhesive-coated connecting strip upon said mouthpiece to provide an overlapping connection between said pair of cigarettes and mouthpiece, said cigarettes and mouthpieces overlying the adhesive-coated strip and being disposed throughout the wrapping operation with their longitudinal axes at the level of the pitch circle of the driving gear wheel, means to impart a continuous rotary motion to said drum during operation thereof, a pair of radially movable folder carriers on said drum and adjacent each groove therein, means to impart an operative movement to each carrier of said pair, spring-urged folding elements pivoted to the outermost ends of said carriers adapted to fold down each of two projecting flaps of the connecting strip in turn without rotation of the cigarettes or mouthpiece relative to the drum to provide a tubular sleeve surrounding the abutting contact points between the cigarettes and mouthpiece and adhering thereto, and cutter means adapted to divide each mouthpiece into two sections to provide two cigarettes with attached mouth-

pieces.

3. In apparatus for uniting cigarettes with mouthpieces, means for folding the loose end flaps of an adhesive-coated strip of any desired material, attached to a cigarette-mouthpiece assembly and to be connected about the abutting points of the elements thereof by mounting the assembly and attached strip on a rotary drum having its surface supporting the assembly continuously moving perpendicularly to the longitudinal axis of the cigarette-mouthpiece assembly and on which the assembly is held by suction, characterised in that folding elements which are arranged on the drum and preferably move thereon in radial direction, fold the connecting strips perpendicularly to the cigarette-mouthpiece assembly without rotation relative to the drum of the latter, the longitudinal axis of which is located on the drum, from a point of reception thereon to a point of delivery therefrom of the assembly, at the level of the pitch circle of a drum driving wheel located co-axially thereto, for example a spur gear wheel.

4. Means according to Claim 3, characterised in that each cigarette-mouthpiece assembly is held during the initial movement of the folding elements by means of holding pins.

5. Means according to Claims 3 and 4 characterised in that the folding elements are supported by folder carriers rotatably mounted on a pivot and bearing by spring pressure with one surface against bearing members of the drum whereby carrier movement is effected by means of a cam drive.

6. Means according to Claims 3 and 4, wherein the folding elements are supported by folder carriers each arranged as a linked assembly in the manner of a parallelogram linkage, the drive being effected through an angled lever, for example from a cam and follower drive.

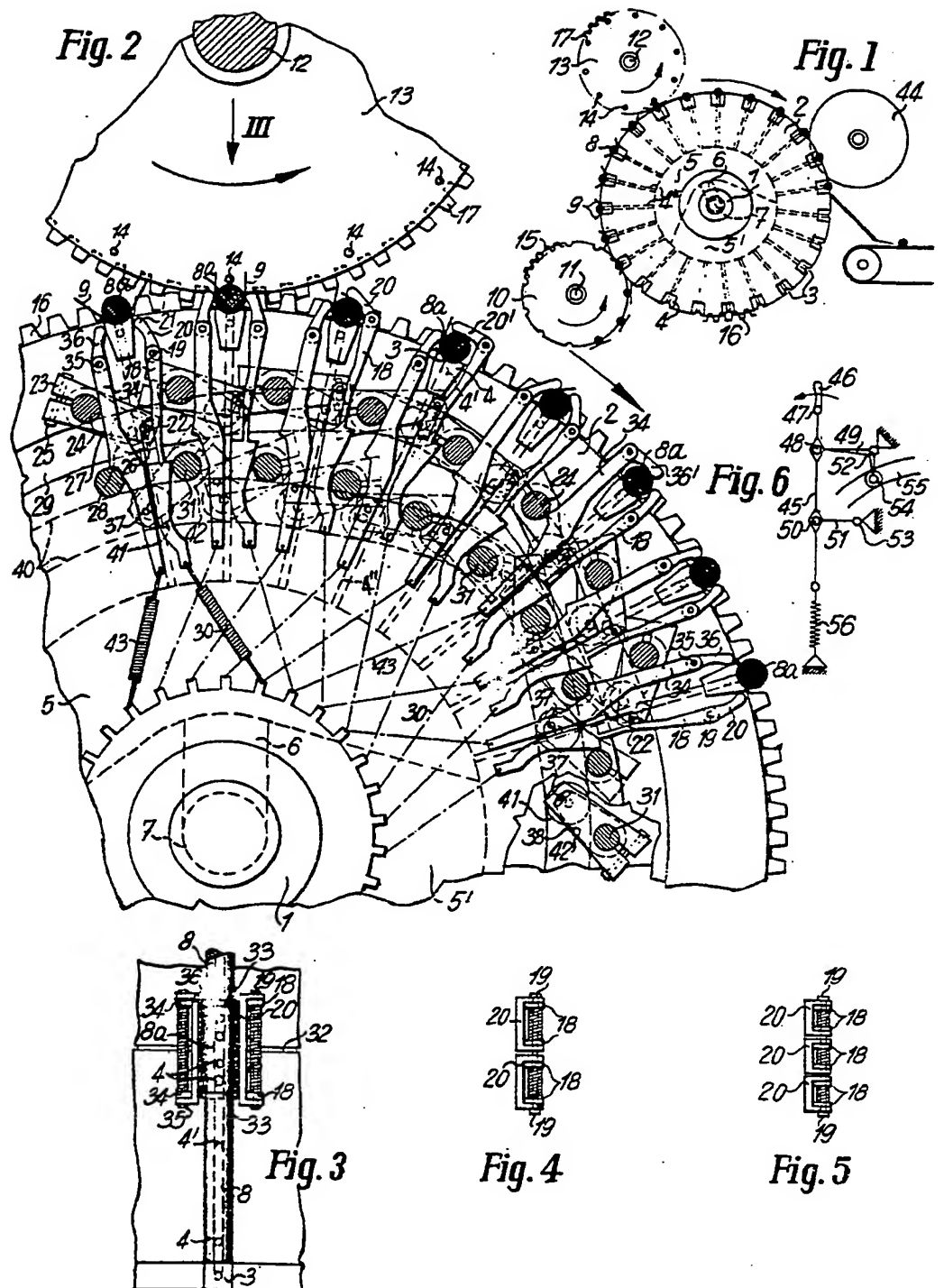
7. Means according to Claim 4, wherein the holding pins are also independently movable.

8. Means according to Claim 4, wherein the folding elements are each of multi-part form and the parts have a common drive.

9. Apparatus for uniting cigarettes with mouthpieces substantially as herein described and illustrated.

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COMPLETE SPECIFICATION

2 SHEETS

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SHEETS 1 & 2

Fig. 1

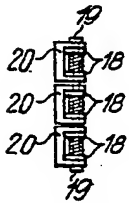
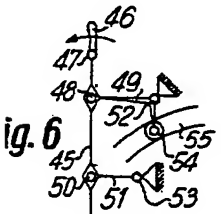
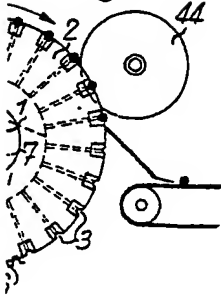


Fig. 5

Fig. 7

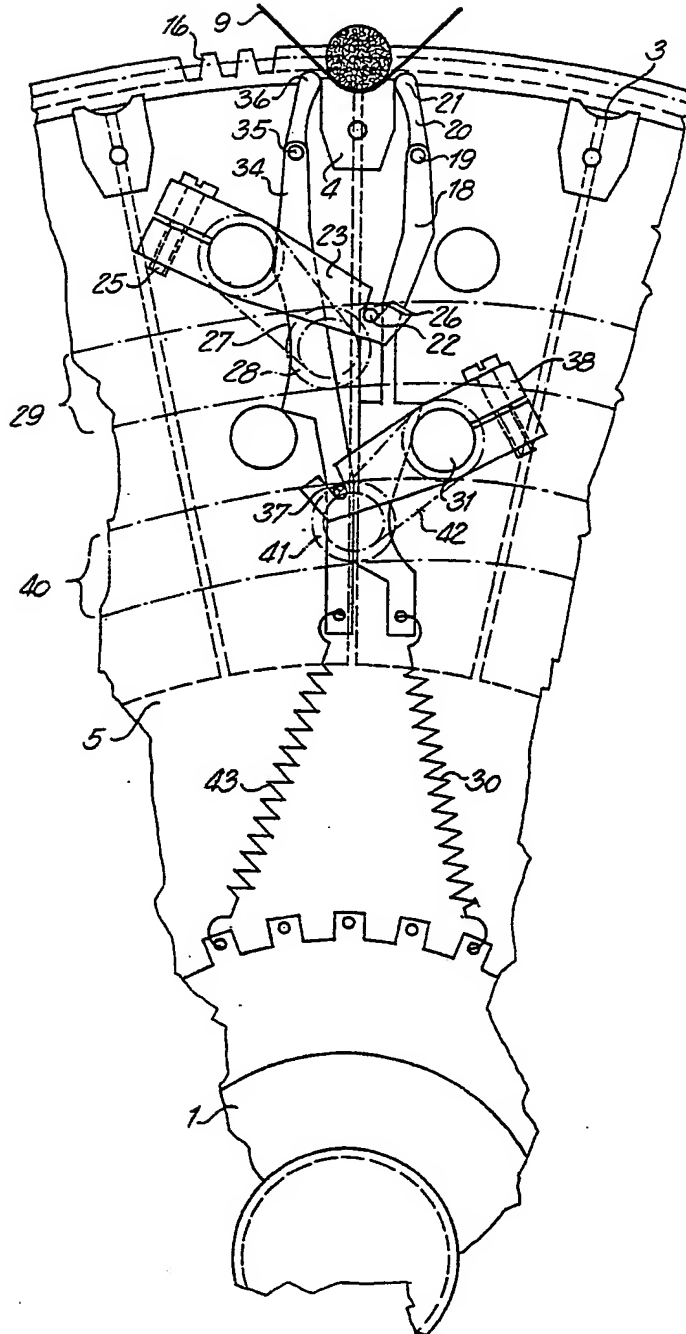


Fig. 7

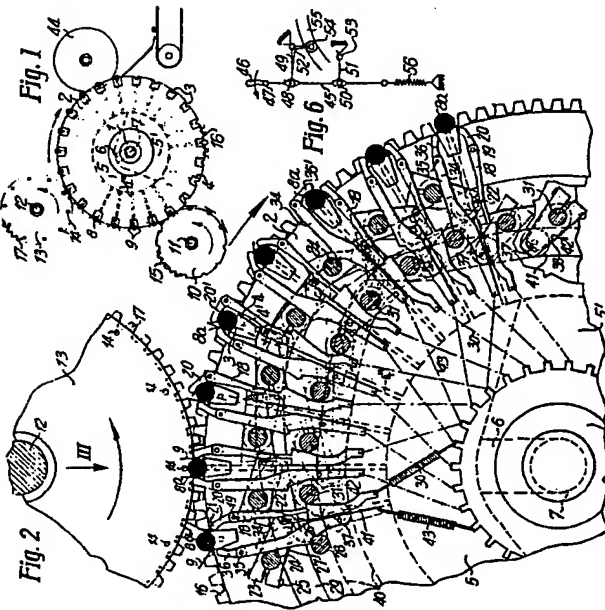
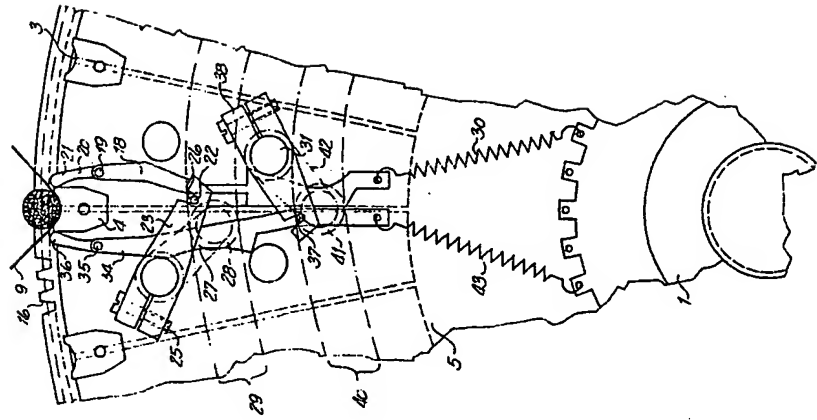


Fig. 1

Fig. 6

Fig. 2

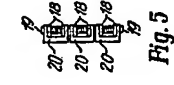


Fig. 5

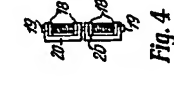


Fig. 4

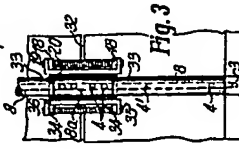


Fig. 3

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